

RCRA ~~PART B~~ PERMIT
FOR THE
IDAHO NATIONAL LABORATORY

Volume 14
INTEC Liquid Waste Management System

Attachment 6, Sections F-3, F-4, and F-5
Procedures to Prevent Hazards

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ACRONYMS

1	CFA	Central Facilities Area
2	CFR	Code of Federal Regulations
3	CPP	Chemical Processing Plant
4	DCS	Distributed Control System
5	DOE	Department of Energy
6	DOE-ID	Department of Energy, Idaho Operations Office
7	EP/RCRA CP	Emergency Plan/Resource Conservation and Recovery Act Contingency Plan
8	HEPA	high-efficiency particulate air
9	IDAPA	Idaho Administrative Procedures Act
10	INL	Idaho National Laboratory
11	INTEC	Idaho Nuclear Technology and Engineering Center
12	<u>IWTU</u>	<u>Integrated Waste Treatment Unit</u>
13	LET&D	Liquid Effluent Treatment and Disposal
14	PEWE	Process Equipment Waste Evaporator
15	RCRA	Resource Conservation and Recovery Act
16	TFT	Tank Farm Tank
17	TSDF	treatment, storage, or disposal facility
18	WAC	waste acceptance criteria
19	WWH	Westside Waste Holdup

F-3 WAIVER OR DOCUMENTATION OF EMERGENCY PREPAREDNESS AND PREVENTION REQUIREMENTS

F-3a Equipment Requirements [IDAPA 58.01.05.012 and 58.01.05.008; 40 CFR §§ 270.14(b) and 264.32]

F-3a(1) Internal Communications [IDAPA 58.01.05.008; 40 CFR § 264.32(a)]

The ILWMS buildings are equipped with communication devices (i.e., telephones, two way radios, alarm systems, etc.) capable of summoning emergency assistance. The personnel involved in the operation have immediate access to emergency communication devices.

F-3a(2) External Communications [IDAPA 58.01.05.008; 40 CFR § 264.32(b)]

The INTEC communication devices provide direct access to external emergency response agencies.

F-3a(3) Emergency Equipment [IDAPA 58.01.05.008; 40 CFR § 264.32(c)]

The contingency plan, located in Section G of this permit, identifies evacuation routes and locations of RCRA emergency equipment for the PEWE system, the LET&D facility, ~~and~~ CPP-659, ~~and~~ the IWTU.

CPP-604 PEWE System and TFT

Safety and emergency equipment located at CPP-604 is listed below:

- Fire sprinkler system
- Portable fire extinguishers
- Safety showers and eyewashes
- Spill control cabinet
- Plant voice paging and evacuation alarm system
- Communication devices.

For building fire protection, CPP-604 has a fire sprinkler system, which is a heat-activated detection system. This system is connected to alarms at the INL Fire Department located at the Central Facilities Area (CFA). Portable fire extinguishers located throughout the building are inspected monthly.

A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

CPP-641 Tanks

The portable fire extinguisher located outside the door of CPP-641 is inspected monthly. The plant voice paging and evacuation alarm system can be heard inside the building.

Communication devices are inspected daily. If any equipment is missing, it is replaced immediately. Inspections are recorded on appropriate forms.

CPP-601 Deep Tanks

The emergency/safety equipment associated with the WG/WH area include the following:

- Portable fire extinguishers
- Safety showers and eyewashes
- Spill control cabinet
- Plant voice paging and evacuation alarm system
- Communication devices.

A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

CPP-1618

Safety and emergency equipment located at CPP-1618 is listed below:

- Fire sprinkler system
- Portable fire extinguishers
- Safety showers and eyewashes
- Spill control cabinets
- Plant voice paging and evacuation alarm system
- Communication devices.

For building fire protection, CPP-1618 has a fire sprinkler system, which is a heat-activated detection system. This system is connected to alarms at the INL Fire Department located at the CFA. Portable fire extinguishers located throughout the building are inspected monthly.

A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

CPP-659

Safety and emergency equipment located at CPP-659 are listed below:

- Fire sprinkler system
- Portable fire extinguishers
- Safety showers and eyewashes
- Spill control cabinets
- Plant voice paging and evacuation alarm system
- Communication devices.

For building fire protection, CPP-659 has a fire sprinkler system, which is a heat-activated detection system. This system is connected to alarms at the INL Fire Department located at the CFA. Portable fire extinguishers located throughout the building are inspected monthly.

A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

CPP-1696

Safety and emergency equipment located at CPP-1696 are listed below:

- Fire sprinkler system
- Portable fire extinguishers
- Safety showers and eyewashes
- Spill control cabinet
- Plant voice paging and evacuation alarm system
- Communication devices.

For building fire protection, CPP-1696 has a fire sprinkler system, which is a heat-activated detection system. This system is connected to alarms at the INL Fire Department located at the CFA. Portable fire extinguishers located throughout the building are inspected monthly.

A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

F-3a(4) Water For Fire Control [IDAPA 58.01.05.008; 40 CFR § 264.32(d)]

Two insulated fire water supply tanks with maximum capacities of 800,000 gal each supply the INTEC fire water system. These tanks are maintained between 400,000 and 600,000 gallons of water for fire suppression. Diesel powered pumps move water from wells to maintain these levels. Electric jockey pumps are located on the outlet lines that keep the fire water lines pressurized. Electric pumps are located on the outlets of these tanks to supply water for hose streams and automatic sprinklers at adequate volume and pressure.

F-4. PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

F-4a. Unloading Operations [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(i)]

Transfers of hazardous waste to and from ILWMS are conducted through piping systems. Wastes generated at other INL Site facilities may be introduced to the ILWMS via the CPP-1619 Truck Unloading Bay through tanker trucks or containers. Unloading operations at this facility are controlled by standard operating procedures. During unloading operations, appropriate actions are taken to contain particulate and radioactive emissions (e.g., use of a portable HEPA air mover). A stainless-steel drip pan is used to collect possible leaks during unloading. Personnel will inspect for evidence of improper connections before beginning the transfer or acceptance of waste at CPP-1619. Waste staging areas will be inspected for leaks or spills when waste is being received.

Hazards in unloading and staging operations will be minimized through the following:

Waste handling areas are controlled to provide adequate space to allow unobstructed movement of waste transfer equipment and personnel.

Operations personnel will be present at all times during unloading or staging operations; therefore, any spilled or leaked material will be immediately detected and contained. Spill response will be in accordance with the INL Emergency Plan Resource Conservation and Recovery Act Contingency Plan (EP/RCRA CP), except for incidental spills, which would be immediately cleaned up.

Personnel will be trained as noted in Section H of this permit.

F-4b. Run-off [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(ii)]

Buildings CPP-604, CPP-641, CPP-649, CPP-659, CPP-1618, ~~and~~ CPP-601, ~~and~~ CPP-1696 are fully enclosed buildings that prevent run-off from hazardous waste handling areas to other areas or the environment. Buildings ~~CPP-601, CPP-604, CPP-641, CPP-649, CPP-659, and~~ CPP-1618 ~~are~~ inside the 100-year flood plain boundaries ~~boundary and CPP-601, CPP-604, CPP-641, CPP-649, CPP-659, and~~ CPP-1696 are outside of the 100-year flood plain boundary as postulated in the ~~Koslow and Van Haaflen, 1986, Flood Routing Analysis for a Failure of Mackay Dam, EGG-EP-7184~~ Big Lost River Flood Hazard Study, November 2005 (see Volume 3 of the INL permit application). The INL emergency plan provides for establishing plans for the protection of buildings and equipment as necessary during flooding conditions. This could include sand bagging or building berms, dikes, or trenches.

Appendices VI, VII, and VIII contain Engineering Design Files EDF-1747, EDF-2613, and EDF-2470. These EDFs discuss the effects of hydrostatic and hydrodynamic forces as a result of hypothetical flooding on the ILWMS. These studies demonstrate that the facilities would withstand the floodwaters.

F-4c. Water Supplies [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(iii)]

Contamination of water supplies by spills of mixed waste is prevented by building features such as high-density concrete base, stainless-steel lining, epoxy-coated walls, sloped floors, trenches, drains, double-encased piping, and liquid collection tanks, as well as various means of leak detection. See Section B, Facility Description, for typical building construction details.

F-4d. Equipment and Power Failure [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(iv)]

Some components of the ILWMS are supplied with redundant equipment. If equipment should fail on these systems, it would have minimal effect on the operating unit, since the redundant equipment would be started and the operation stabilized. The failed equipment would then be investigated to determine the cause of the failure, and repairs would be initiated. If a system that did not have redundant equipment were to fail, the operating unit would be secured.

Upon total loss of electrical power, ILWMS equipment that manages hazardous and mixed wastes is designed to shut down in a manner that protects employees, equipment, human health, and the environment.

1 Cranes and hoists are considered non-critical equipment and are not supplied with emergency
2 standby power. This type of equipment is designed to fail in place. Movement will be suspended until
3 power is restored.

4 The DCS is designed with battery backup to maintain operability and to ensure safe shutdown.

5 **CPP-604 PEWE System and TFT**

6 The Evaporator Feed Collection Tank (VES-WL-133), the Process Condensate Surge Tank
7 (VES-WL-131) and the Process Condensate Collection Tanks (VES-WL-106, VES-WL-107, and VES-
8 WL-163) are all equipped with two redundant transfer pumps.

9 The PEW evaporators (EVAP-WL-129 and EVAP-WL-161) and associated heat exchangers are
10 identical and may be operated independently or in parallel.

11 PEW evaporator bottoms can be stored/treated in either VES-WL-101 or VES-WL-111.

12 **CPP-601 Deep Tanks**

13 There are a total of four Deep Tanks (VES-WG-100, VES-WG-101, VES-WH-100, and VES-
14 WH-101) that are essentially redundant systems. Each tank is equipped with sparge flow instruments,
15 level instrumentation, one transfer jet, and one transfer pump.

16 Sufficient redundancy exists such that a receiving tank is available for collection. Loss of a
17 sparge flow or level instrument may require an operator to switch collection to another tank, but would
18 not require total cessation of operations.

19 If a system that does not have redundant equipment was to fail, the operating process would be
20 shut down and not operated again until the failure was repaired.

21 **CPP-641 WWH Tanks**

22 There are a total of three WWH Tanks (VES-WL-103, VES-WL-104, and VES-WL-105) that are
23 essentially redundant systems. VES-WL-103 and VES-WL-105 are equipped with sparge flow
24 instruments, level instrumentation, one transfer jet, and one transfer pump. VES-WL-104 is equipped
25 with sparge flow instruments, level instrumentation, two transfer jets, and one transfer pump.

Sufficient redundancy exists such that a receiving tank is available for collection. Loss of a sparge flow or level instrument may require an operator to switch collection to another tank, but would not require total cessation of operations.

If a system that does not have redundant equipment was to fail, the operating process would be shut down and not operated again until the failure was repaired.

CPP-1618 LET&D Facility

The LET&D fractionators (FRAC-WLL-170 and FRAC-WLK-171) and associated heat exchangers are identical.

The Acid Fractionator Bottoms Tank (VES-WLL-195) is equipped with two redundant transfer pumps.

CPP-659 ETS

There are no redundant systems on the ETS. Upon loss of electrical power the operator would initiate the Rapid Shutdown System (RSS). The RSS would secure the ETS in a configuration that is protective of human health, the environment, and equipment.

CPP-1696 IWTU

The IWTU has a Rapid Shutdown System (RSS) which would secure the IWTU in a configuration that is protective of human health, the environment, and equipment. The IWTU has redundant equipment to allow safe operation of the steam reformers. In the event of a power failure, these redundant systems enable the IWTU processes to be maintained in a stable configuration that is protective of human health, the environment, and equipment until power is restored.

Both the Denitration and Mineralization Reformer and the Carbon Reduction Reformer are equipped with multiple redundant thermocouples in the fluidized bed region.

There is a redundant hydrogen monitor on the process gas outlet of the Denitration and Mineralization Reformer.

There is a redundant oxygen monitor on the offgas outlet of the Carbon Reduction Reformer.

1 There are redundant water supply systems (demineralized and treated water) and a backup supply
2 tank to the Offgas Cooler.

3 There is a redundant offgas blower for the IWTU.

4 There is a redundant process exhaust blower for the IWTU.

5 There is a redundant building ventilation exhaust blower for the IWTU.

F-4e. Personnel Protection Equipment [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(v)]

6 Operations are conducted according to written procedures. Eyewash stations, safety showers,
7 respirators and protective clothing are available as necessary to mitigate personnel exposure to hazardous
8 waste.

F-4f. Releases to the Atmosphere [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(vi)]

CPP-604 PEWE System and TFT

10 In the event of a release to the vault from VES-WM-100, -101, or -102, the offgas would be
11 contained in the vault until the hatch covers located in the sample corridor in CPP-604 were removed.
12 Any release would then be removed by the offgas system that maintains a slight vacuum on the sample
13 corridor to a high-efficiency particulate air (HEPA) filter system before being released to the atmosphere
14 through the INTEC Main Stack.

15 In the event of a release to the rest of the vaults and cells associated with the PEWE system, the
16 offgas would be removed by the offgas system that maintains a slight vacuum on the vaults and cells.
17 The offgas would then be routed to a HEPA filter system before being released to the atmosphere through
18 the INTEC Main Stack.

CPP-641 Tanks

20 In the event of a release to the VES-WL-103 or VES-WL-104/VES-WL-105 vault, the offgas
21 would vent to the building's ventilation system that maintains a slight vacuum on the vaults. The offgas
22 is routed through a HEPA filter system before being released to the atmosphere through its own stack.

CPP-601 Deep Tanks

In the event of a release to any one of the cells, the building ventilation system will remove any offgases containing hazardous constituents to a HEPA filter system before being released to the atmosphere through the INTEC Main Stack.

CPP-1618

In the event a release to the cells associated with the LET&D, the offgas would be removed by the building ventilation system that maintains a slight vacuum on the cells. The building ventilation is then routed to the ventilation APS HEPA filter system before being released to the atmosphere.

CPP-659

In the event of a release to the cells associated with the ETS, the air would be removed by the cell ventilation system that maintains a slight vacuum on the cells. The air would then be routed to a HEPA filter system before being released to the atmosphere through the CPP-659 stack.

CPP-1696

In the event of a release to the cells associated with the IWTU, the air would be removed by the cell ventilation system that maintains a slight vacuum on the cells. The air would then be routed to a HEPA filter system before being released to the atmosphere through the CPP-1696 stack.

F-5. PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES [IDAPA 58.01.05.008 AND 58.01.05.012; 40 CFR §§ 264.17(a) AND 270.14(b)(9)]

Waste acceptance criteria (WAC) have been established for wastes that are to be transferred to the ILWMS to prevent reaction of potentially incompatible wastes, see Section C-2f of this permit.

Waste must be characterized per procedure, to ensure waste compatibility before it can be transferred to CPP-604 TFT system, CPP-601 Deep Tanks, and the Westside Waste Holdup (WWH) tanks.